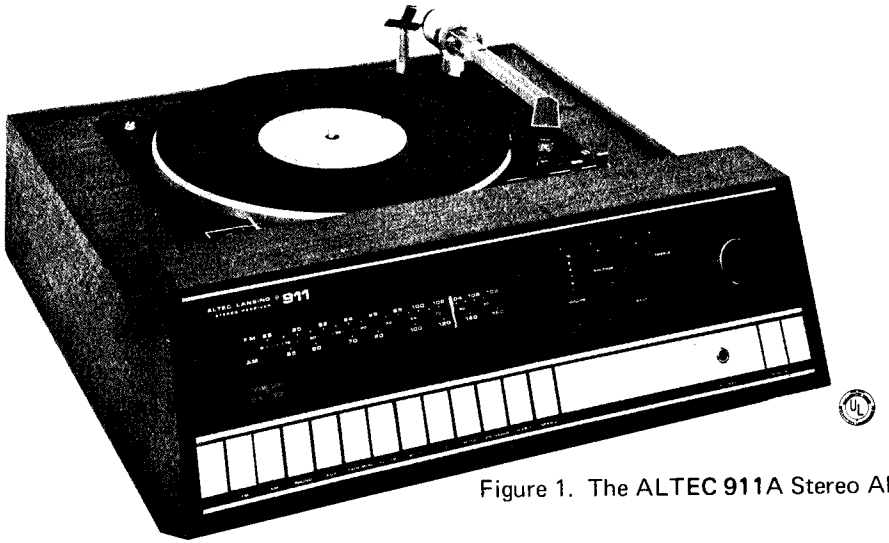


Figure 1. The ALTEC 911A Stereo AM/FM Music Center

Your new ALTEC 911A Stereo AM/FM Music Center is a design using the latest technology. This high-performance modular system is specially designed for use with ALTEC's full-size and bookshelf speaker systems. The 911A includes an AM/FM stereo receiver similar to ALTEC's new 714A receiver, Garrard's finest automatic turntable (model SL95B) and a Shure Elliptical 'High-Track' Cartridge (model M93E) for precise trackability and flat response. The 911A Music Center uses the newest solid-state circuits and will provide you with years of listening pleasure. Some of the outstanding features of your new ALTEC 911A are:

- 180 watts of IHF music power (44/44 watts RMS)
- No transformers in any portion of the audio amplifiers
- Three FETs (field effect transistors) in FM tuner
- High-performance IF strip in FM tuner using integrated circuits and two crystal filters
- Garrard's best automatic turntable (SL95B)
- Shure Elliptical 'High-Track' cartridge (M93E)
- Automatic switching for FM stereo
- Blackout dial with 7-inch tuning scale
- A muting circuit to eliminate 'noise' when tuning from station-to-station
- A center tuning meter for precise FM tuning
- ALTEC's 'Fail-Safe Active Dissipation Sensing Circuit' for protection of output transistors
- Slide controls for volume, balance, bass and treble
- Hand-finished walnut cabinet and molded dust cover

SPECIFICATIONS

FM Tuner Section

Sensitivity:	1.9 μV (IHF Standard)
Signal-to-Noise Ratio:	62 dB at full modulation and 1 mV input
Capture Ratio:	2.0 dB (IHF Standard)
FM Stereo Separation:	Greater than 40 dB at 1 KHz
Total Harmonic Distortion (THD):	Less than 0.5% at full modulation
Audio Frequency Response:	±1 dB from 20 Hz to 15 KHz
Alternate Channel Selectivity:	48 dB
Image Frequency Rejection:	84 dB at 100 MHz
IF Frequency Rejection:	100 dB at 100 MHz
Antenna Impedance:	300 ohms

AM Tuner Section

Sensitivity:	18 μV at 20 dB signal/noise ratio
Signal-to-Noise Ratio:	40 dB at 1 mV
Adjacent Channel Selectivity:	40 dB
Other Spurious Response:	70 dB

Amplifier Section

Power Output:	Both channels driven simultaneously – 44/44 watts RMS with 8-ohm load
	Total 180 watts IHF music power (90 watts each channel) with 4-ohm load
Distortion:	Less than 0.5% THD
	Less than 0.5% IM (0.5 watt to rated output)
Frequency Response:	±1 dB from 15 Hz to 45 KHz
IFH Power Bandwidth:	15 Hz to 25 KHz
Channel Separation:	60 dB
Damping Factor:	30
Hum and Noise –	
Auxiliary and Tape:	85 dB below rated output
Phono:	65 dB below rated output
Input Sensitivity –	
Phono:	4.0 mV
Auxiliary:	250 mV
Tape Monitor:	450 mV
High-Frequency Filter:	12 dB/octave above 6 KHz
Tone Control Range:	±16 dB at 50 Hz and 15 KHz

Garrard SL95B Automatic Turntable
(see enclosed Garrard Instruction Manual)

Speeds:	33-1/3, 45 and 78 rpm
Turntable:	Cast aluminum, 12" diameter

Shure M93E Cartridge

Stylus (N93E):	Elliptical diamond 0.0007" x 0.0004"
Tracking Force:	1.5 to 3.0 grams
Channel Separation:	More than 25 dB at 1 KHz

General

Overall Dimensions:	6-7/8" H x 19-1/4" W x 19-1/2" D
Power Requirements:	120V, 50/60 Hz
Weight:	45 pounds

CONTROLS – INDICATORS – CONNECTIONS – FUSES

Front Panel
(see Figure 2)

Tuning Control (knob)

Tuning Dial and Indicator

Center Tuning Meter

STEREO Indicator (lamp)

VOLUME Control (matched dual slide)

BALANCE Control (slide)

BASS Control (matched dual slide)

TREBLE Control (matched dual slide)

FM (push-on switch)

AM (push-on switch)

PHONO (push-on switch)

AUX (push-on switch)

TAPE MON (push-on/push-off switch)

HI FILTR (push-on/push-off switch)

MUTE (push-on/push-off switch)

LOUD (push-on/push-off switch)

MONO (push-on/push-off switch)

VOL RANGE (push-on/push-off switch)

SPKR 1 (push-on/push-off switch)

SPKR 2 (push-on/push-off switch)

PHONES (jack)

POWER (push-on/push-off switch)

Rear Panel
(see Figure 3)

SWITCHED 200 WATTS MAX (AC power outlet for external equipment)

SPEAKER-1, R/L (spring-loaded terminal blocks)

SPEAKER-2, R/L (spring-loaded terminal blocks)

GND (screw terminal)

ANTENNA, FM 300Ω/AM (screw terminals)

CENTER CHANNEL (jack)

RECORDER OUTPUT, R/L (jacks)

TAPE MON, R/L (jacks)

AUX, R/L (jacks)

SLOW AC 125V-3A (fuse)

FAST 3A, R/L (fuses)

Turntable
(see enclosed Garrard Instruction Manual)

DESCRIPTION

The ALTEC 911A Stereo AM/FM Music Center contains all the facilities necessary to create a complete home music center with enough power to drive any speaker systems – including the lowest efficiency models. It will receive AM, FM and FM stereo broadcasts. It contains two complete amplifier systems. The 911A uses a Garrard SL95B record changer with a Shure M93E Elliptical 'High-Track' Cartridge installed. The inputs, outputs and controls on the 911A provide for the addition of a tape deck or tape machine, up to four speaker systems, or other optional audio equipment as may be desired. The 911A

is housed in an elegant hand-finished walnut cabinet and includes a molded plastic dust cover for protection of the turntable.

Speaker connections permit installation of two stereo pairs of speaker systems with separate controls for each pair. A center channel output is available for use with an additional amplifier and loudspeaker in areas where monophonic reproduction may be desired.

Double Protection

The 911A has three fuses for overload protection plus our 'Fail-Safe Active Dissipation Sensing Circuit' providing electronic protection that automatically limits the drive to the output transistors. If a malfunction occurs, one or more of the fuses will blow. If a fuse blows, power should be switched off as soon as possible to avoid damage to other components. Necessary repairs should be made by qualified personnel. Proper installation and correct operation assures the best protection for the 911A. The following instructions should be carefully read and applied. Compliance with them will assure the utmost in your listening enjoyment and the maximum of trouble-free performance from your 911A.

INSTALLATION

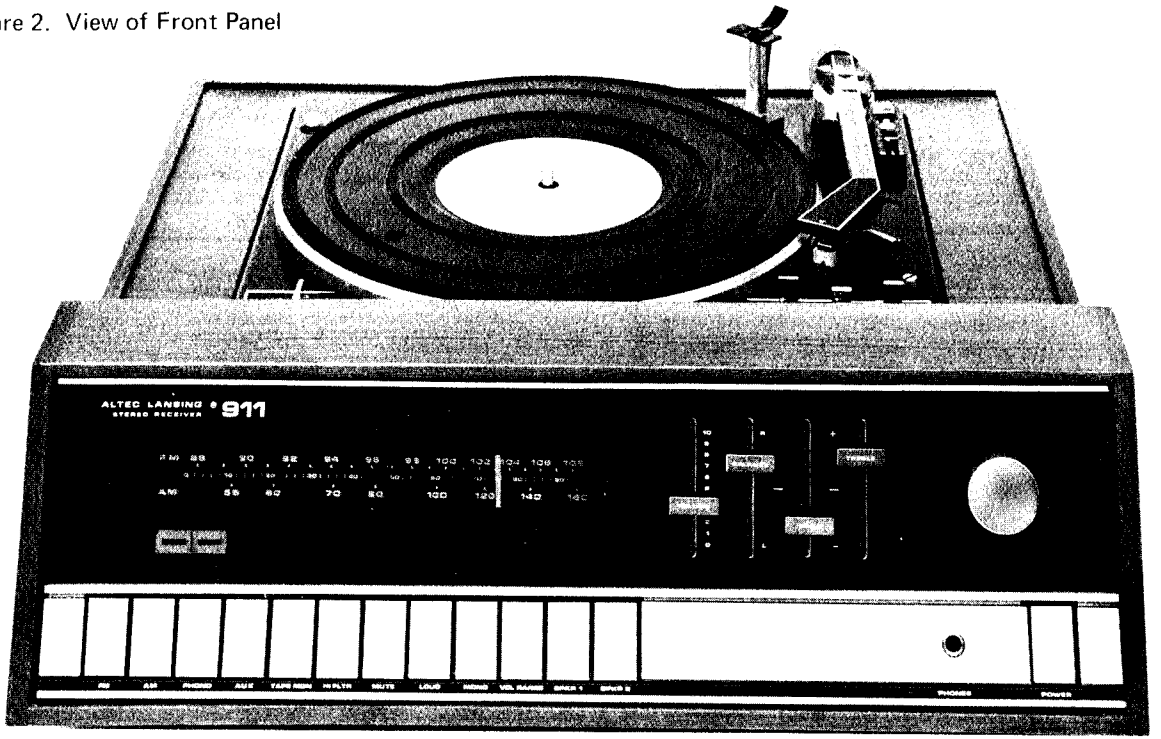
Ventilation Requirements

The performance of any solid-state device may be impaired by high temperature. Such heat may result from a rise in the ambient (surrounding) temperature. Maximum performance will not be obtained unless the 911A is provided with proper ventilation.

The 911A is designed to incorporate the most effective means of dissipating heat from the transistors. The back panel serves as the major heat dispersion area. The 911A should not be placed in a location or installation which impedes the flow of air up and across the back panel.

The four plastic feet on the bottom of the 911A permits an adequate flow of air under the music center to the back panel when it is shelf mounted. Other equipment that may emit heat should be kept away from the unit. DO NOT place the 911A on top of, or closely adjacent to any heat producing unit.

Figure 2. View of Front Panel



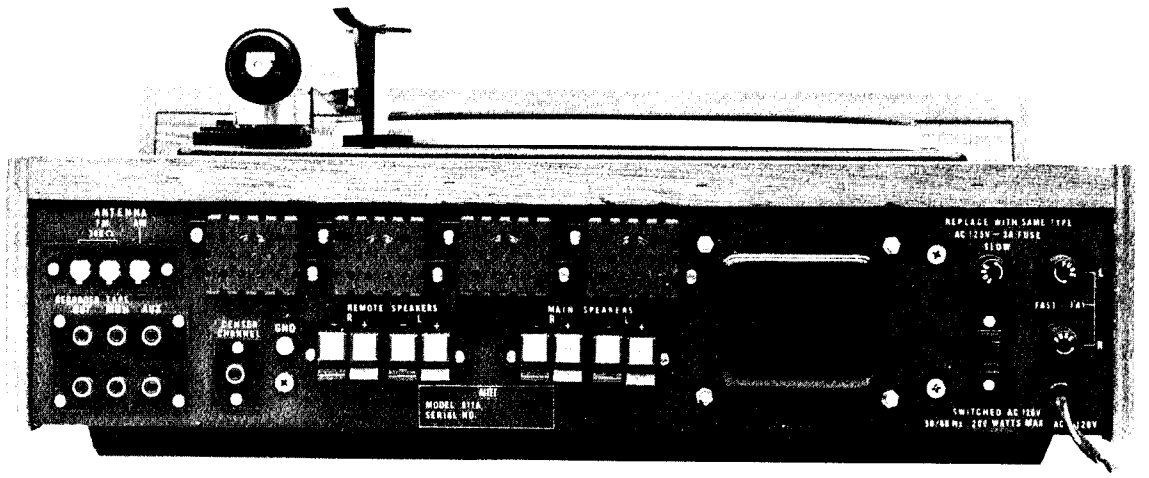


Figure 3. View of Rear Panel

Power Connections

The plug for the power cord can be used in any 120-volt, 60 Hz source. The 911A has one standard power outlet marked SWITCHED 200 WATTS MAX for auxiliary equipment such as record changer, tape machine or tape deck. This outlet provides power only when the POWER switch on the front panel is in the 'on' condition.

FM Antenna Connections

A dipole antenna with 300-ohm twin leads is furnished with the 911A. The antenna is designed for reception of local FM stations only. For best results – especially for stereo reception – an outdoor antenna should be used. The FM antenna used should be connected to the two screw terminals marked ANTENNA FM 300Ω.

AM Antenna Connection

The 911A is equipped with a self-contained ferrite loopstick antenna. If an external AM antenna is required, it should be connected to the single screw terminal marked ANTENNA AM.

Input Connections

The 911A provides four jacks for connection of external input devices.

The TAPE MON, R/L jacks on the rear panel provide for the connection of a tape machine having self-contained preamplification and equalization. Many tape machines use separate heads for recording and playback; an arrangement that permits monitoring directly from the tape while recording. Eg.; with the input of the tape recorder connected to the RECORDER OUTPUT jacks (see below) and the output of the tape recorder connected to the TAPE MON jacks, any program material received by the 911A may be recorded and the recorded signals monitored by the use of the TAPE MON switch on the front panel of the 911A.

The AUX, R/L jacks on the rear panel provide for the connection of record changers equipped with a ceramic or crystal cartridge as well as any other source with an output equal to or greater than 0.5V. Eg.; another tape recorder, cassette, cartridge player or TV.

Output Connections

The 911A provides four output jacks and eight spring-loaded terminals for the connection of main and remote speaker systems.

The PHONES jack on the front panel may be used with any high-quality stereophonic headphones for private listening. The headphones should have an impedance of four to sixteen ohms. The receiver amplifier output is internally connected to the PHONES jack through an attenuator.

The RECORDER OUTPUT, R/L jacks on the rear panel provide a source of audio signal output from the 911A to the input jacks (high-level or line) of a tape recorder. When connected, any program material selected by the 911A may be recorded. The signal at the RECORDER OUTPUT jacks is independent of the VOLUME, BALANCE, BASS and TREBLE controls on the front panel of the 911A.

The CENTER CHANNEL jack on the rear panel provides a monophonic audio signal from the output of the preamplifiers in the 911A. This is a combined signal from both right and left channels for driving an additional amplifier and speaker system in a remote area or to prevent the 'hole-in-the-middle' effect where extreme physical separation exists between the right and left speaker systems.

SPEAKER-1, R+, R-/L+, L- and SPEAKER-2, R+, R-/L+, L- output connections are spring-loaded terminals. Connections should be made, as shown in Figure 4, with stranded lamp cord (zip or Class 11) or with special speaker wire. When using stranded wire, be sure no loose strands are short circuiting to adjacent terminals or to the case of the 911A.

The SPEAKER-1 terminals are provided for connection of the main speakers in the sound system. Connect the main right speaker to the R+ and R- SPEAKER-1 terminals. Connect the main left speaker to the L+ and L- SPEAKER-1 terminals.

The SPEAKER-2 terminals are provided for connection of remote speakers in a second listening area where stereo reproduction is desired. Connect the remote right speaker to the R+ and R- SPEAKER-2 terminals. Connect the remote left speaker to the L+ and L- SPEAKER-2 terminals.

NOTE

Total speaker load impedance should be not less than four ohms.

GND is a screw terminal for grounding the chassis to earth ground.

SPEAKER PHASING

Proper relative phasing of the right and left speaker systems in a stereo home-music system is essential because sound meant to come from the center should appear to emanate from a point midway between the two speaker systems. Many elaborate methods for determining the correct phase are available but it becomes a simple matter if a record with strong bass is used.

Listen to your system by standing directly between and about eight feet in front of the right and left speaker systems. Speaker systems in phase will have more bass volume at the same control setting than speaker systems which are out of phase.

Reverse the connecting wires on one of the speaker systems and if the bass decreases, the speaker systems were in phase. If the bass increases, they were not in phase. They should be left connected in the loud position. Bass notes will be attenuated and stereo sound will tend to 'jump back and forth' between the speaker systems if phasing is not correct.

An alternate method for phasing of speaker systems is to use a monophonic record, preferably with a vocalist. If the sound source appears to be directly between the two speaker systems, they are in phase. If the sound source appears to 'jump back and forth' between the two speaker systems, they are out of phase.

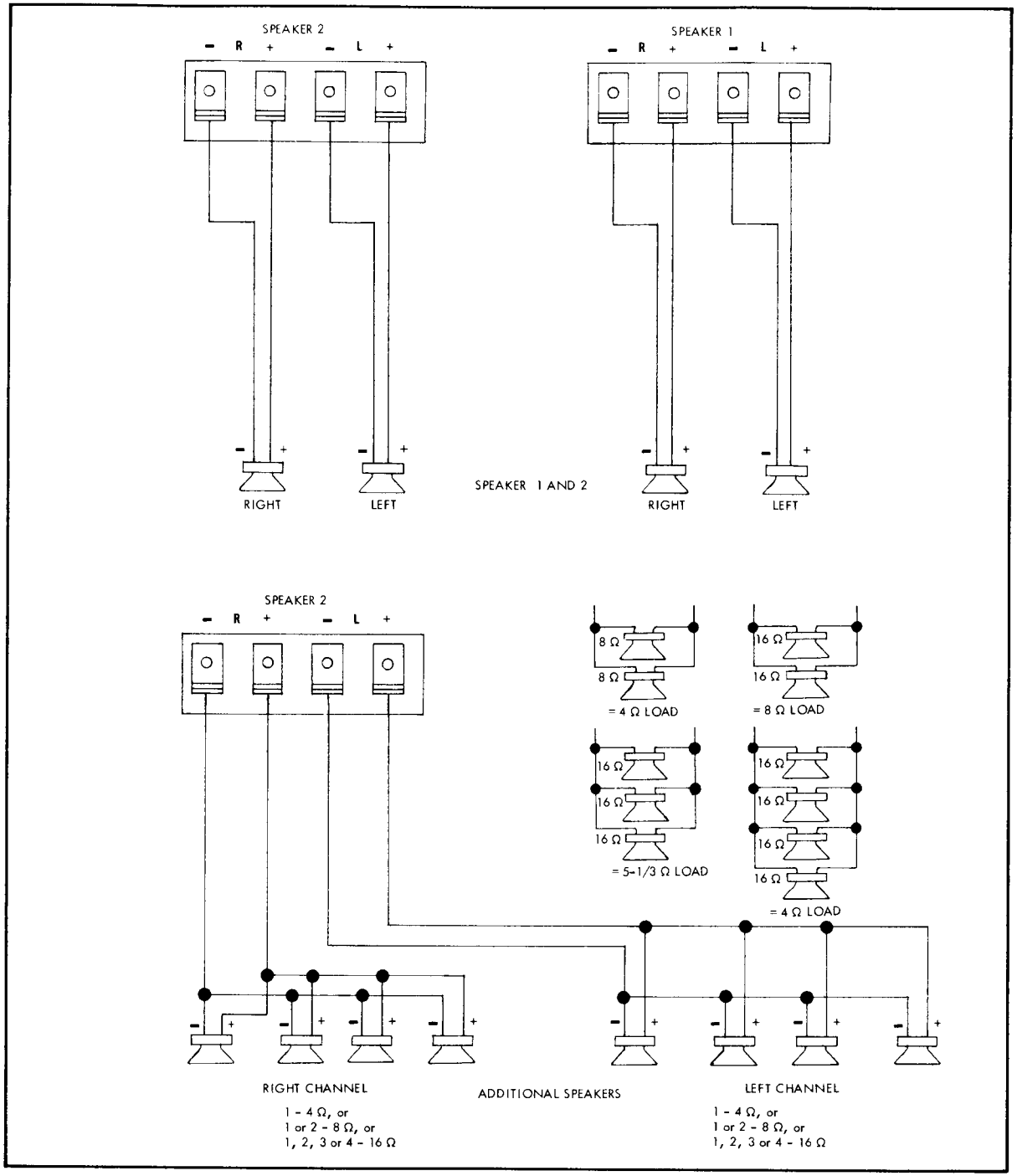


Figure 4. Typical Speaker Connection Arrangements

When properly phased, stereophonic program material will assume an added depth and spread of sound, and the various musical instruments will appear in their proper position as originally recorded. Properly phased monophonic material will appear as a single point source directly between the two speaker systems.

Maintain consistant polarity in wiring your speaker systems. If these connection instructions are followed, the speaker systems should be in phase.

SPEAKER LOCATION

In a stereo system, good listening begins at a distance in front of the speakers equal to their separation and continues for twice the distance. Eg.; if the speakers are placed eight feet apart, the best listening area extends from eight to sixteen feet in front of and midway between the speakers.

A large spread between speakers is permissible if the listening area is moved back proportionately. Listening to two widely separated sound sources from too close a distance, rather than within the desired area of front sound, leaves a noticeable 'hole-in-the-middle'. If speakers are substantially separated, better sound distribution can be obtained by 'angling' the side speakers toward the center of the listening area.

OPERATION

Front Panel Controls

The Tuning Control is a knob, rotated for station selection. Turn it clockwise to increase frequency.

The Tuning Dial and Indicator shows the AM or FM frequency of the station selected. The indicator moves horizontally across the tuning dial.

The Center Tuning Meter has a moving hairline bracketed by two horizontal bars. The position of the hairline should be stabilized midway between the two bars when you are tuning an FM station. The hairline position should be deflected the maximum obtainable distance to the right when you are tuning an AM station.

The STEREO Indicator Lamp automatically illuminates when the FM program being received is being broadcast in stereo.

The VOLUME Control is a dual slide control. Slide it up to increase volume, down to decrease volume.

The BALANCE Control is a slide control. Slide it up to increase gain on the right speaker system and down to increase gain on the left speaker system. Adjust its position to obtain proper stereo balance.

The BASS and TREBLE Controls are similar to the VOLUME Control. Adjust their positions up or down to obtain desired tonal response.

Four interconnected 'push-on' switches (FM, AM, PHONO and AUX) are function selectors. Only one of these switches may be 'on' at a time. To place any one of these switches in the 'on' condition, press the desired switch firmly; the switch is returned to the 'off' condition when any of the other three switches is pressed. The nine 'push-on/push-off' control switches (TAPE MON, HI FILTR, MUTE, LOUD, MONO, VOL RANGE, SPKR 1, SPKR 2 and POWER) are not interconnected. To place any one of these switches in the 'on' condition, press the desired switch firmly; press it again to return it to the 'off' condition. These 13 switches are described below in sequence, beginning from the extreme left of the front panel.

FM	For selection of both monophonic and stereo FM.
AM	For selection of AM.
PHONO	For playback of monophonic or stereo records.
AUX	Permits connection of any additional source having a high-level audio output signal (tape recorder, cassette, TV, etc.).
TAPE MON	Permits direct monitoring of tape being recorded. When using a recorder with separate record and playback heads, permits monitoring of program material after it has been recorded. This switch has no affect on the input signal being recorded; however, the function selector switch (FM, AM, PHONO or AUX) for the source to be recorded must be 'on'.
HI FILTR	Attenuates the high frequencies above 6 KHz for noisy stations, records or tape.
MUTE	Eliminates noise between stations on FM while tuning.
LOUD	Provides the required compensation (adds 10 dB boost at 100 Hz up to the mid-position of the VOLUME Control) for low-level listening.
MONO	Combines left and right channels for both speakers and turns off multiplex section on FM stereo. Permits single-channel program material to be heard through all the speaker systems connected to the 911A. When playing monophonic recordings with a stereo cartridge, the MONO switch should be used to cancel the rumble and noise introduced by the vertical component of the monophonic record.
VOL RANGE	Reduces gain for low-level listening.
SPKR 1	The main speaker systems are connected to the receiver when the SPKR 1 switch is 'on'. They are disconnected from the receiver when the SPKR 1 switch is 'off'.
SPKR 2	To receive program material on the remote speaker systems. This switch operates in the same manner as the SPKR 1 switch.
POWER	Turns the receiver power on or off.

Automatic Turntable

The Garrard record player has been checked and adjusted with the installed cartridge, except the counterweight for the phono arm has been removed for shipping. Install the counterweight in accordance with the instructions on page 4 of the enclosed Garrard SL95B Instruction Manual. Read the Garrard SL95B Instruction Manual for operation of the record player.

TUNING PROCEDURES

The 911A music center is designed for AM reception and for FM monophonic and stereo reception.

AM Tuning

AM tuning may require up to six steps:

1. Press POWER switch 'on'.
2. Press AM switch 'on'.
3. Press SPKR 1 and/or SPKR 2 switch 'on'.
4. Rotate tuning knob to desired station and simultaneously check the Center Tuning Meter below the tuning dial. The meter should indicate maximum deflection to the right.
5. Adjust the VOLUME, BALANCE, BASS and TREBLE slide controls to suit your preference.
6. If background 'hissing' occurs on weak stations, it can be eliminated by pressing the HI FILTR switch 'on'.

FM Tuning

FM tuning may require up to nine steps:

1. Press POWER switch 'on'.
2. Press FM switch 'on'.
3. Press SPKR 1 and/or SPKR 2 switch 'on'.

4. Rotate tuning knob to desired station and simultaneously check the Center Tuning Meter below the tuning dial. The meter should be at mid-scale when the receiver is 'on-station'.

5. Check the STEREO Indicator Lamp. It should illuminate if the broadcast being received is in stereo. It should not light if the broadcast is monophonic.

6. Adjust the VOLUME, BALANCE, BASS and TREBLE slide controls to suit your preference.

7. If background noise occurs with stereophonic reception, it can be minimized by pressing the MONO switch 'on'.

8. If background 'hissing' occurs on weak stations, it can be eliminated by pressing the HI FILTR switch 'on'.

9. If the noise between stations is objectionable, it can be minimized by pressing the MUTE switch 'on'.

MAINTENANCE AND SERVICE

The ALTEC 911A is designed for a long and trouble-free life. If a malfunction does occur, service should be performed by an ALTEC Qualified Service Representative. A list of ALTEC repair stations is enclosed for your information. Or if you desire, you may ship the 911A prepaid to Customer Service, ALTEC Lansing, 1515 South Manchester Avenue, Anaheim, Calif. 92803. For additional information or technical assistance, call (714) 774-2900, or TWX 910-591-1142.

Fuse Replacement

The 911A is equipped with three fuses for transistor protection. If fuses need replacement, verify type of fuse from parts list and replace with identical fuses after determining cause of failure. If either channel cuts out, turn the receiver off immediately and check for improper speaker-system connections. DO NOT allow the receiver to operate if any protective fuse is blown.

Cover Removal

Remove the six screws securing the upper cabinet (with turntable) to the bottom chassis cabinet. These screws are located three on each side (left and right) of the bottom panel. After removing the screws, set the unit down flat and pull the cabinet slightly forward as you raise it from the bottom chassis to clear the switches on the front panel; then tilt it back and set it up vertically behind the unit. Refer to the Garrard manual for removal of the turntable. With the top off, all circuit boards, lamps, etc., are accessible for servicing.

Front Panel Removal

Remove the knobs from all controls, except the push-button switches, by easing them off the control shafts. Remove the six screws securing the front panel (three at each side) and slide the panel forward from the 911A chassis.

Lamp Replacement

Remove the cover as described above. The tuning dial illuminating lamps can be reached from the top of the unit. If the meter illuminating lamp and/or the STEREO indicator lamp is to be replaced, loosen the FM IF board and remove the two screws securing the plate behind the lamps. Verify type of lamp(s) from parts list and replace with identical lamps.

Circuit Board Replacement

Remove the cover as described above. For those boards mating with a connector, loosen the clamp securing the board in the connector and unplug the board. For those boards not seated in a connector, unsolder wiring to board terminals one at a time and solder each wire to the corresponding terminal on the replacement board. A defective board may be removed, repaired and replaced, or it may be replaced with a new board.

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The following information is for
ALTEC Qualified Service Representatives.

TRANSISTOR MAINTENANCE

Transistors and integrated circuits are inherently long-life devices and normally should not require replacement during the life of the equipment. If it becomes apparent through systematic troubleshooting that replacement is necessary, a few precautions must be observed.

Protection

Transistors can be damaged by excessive heat. When removing or replacing a transistor soldered to tie points or to an etched circuit board, use a small soldering iron with a 1/8" diameter chisel tip, and use small-diameter, high tin content solder.

On etched circuit boards, use a toothpick inserted from the conductor side to clean out the holes before inserting the new transistor. High heat reduces conductor-to-board bonding. Pressure applied from the component side may cause the pad and conductor to lift from the board.

Orientation

Transistors are packaged in various case sizes and types with various lead configurations. Typical solid-state package configurations used in the 911A are shown in Figure 5. Before removing a transistor from an etched circuit board or tie points, make a sketch of the orientation of its leads with respect to the circuit board or tie points. Forming the leads on the new transistor to conform with the leads on the one being replaced will also aid in making proper connections.

Before removing small 'plug-in' transistors, note the position of the index tab with respect to the socket. Cut the leads on the new transistor to the required length and insert them into the socket properly indexed.

Power Transistors

Be sure the following conditions exist when replacing transistors:

1. The mica insulator is not damaged.

2. No grit or metal particles are lodged between the transistor and the heat sink.

3. Both sides of the mica insulator are covered with silicone grease or fluid.

4. Mounting screws are tight.

5. The protective cover is in place.

Transistor Testing

Transistors should be checked with a transistor tester. If one is not available, an ohmmeter may be used because most transistor failures result in a collector-to-emitter short or open circuit. Remove the suspected transistor from the circuit. Connect the ohmmeter leads to the collector and the emitter and read on the low-ohm scale. If the resistance reading is virtually the same when the ohmmeter connections are reversed, the transistor is short circuited. If the ohmmeter indicates infinity on the high megohm scale for both connections of the ohmmeter, the transistor is open circuited.

SERVICING ETCHED CIRCUIT BOARDS

Before removing or replacing components on etched circuit boards, read and observe the following precautions.

1. Use a small soldering iron with a 1/8" diameter chisel tip and use small-diameter, high tin content solder.

2. Components may be removed by placing the soldering iron on the component lead on the conductor side of the board and pulling out the lead. Avoid overheating the conductor.

3. If the component is obviously faulty or damaged, clip the leads close to the component and then unsolder the leads from the board. Withdraw the leads from the component side.

4. Since the conductor part of the etched circuit board is a metal-plated surface covered with solder, use care to avoid overheating and lifting the conductor from the board. A method for repair is to solder a section of good conducting wire along the damaged area and then seal it with epoxy.

5. Clear the solder from the circuit board holes before inserting the leads of the new component. Heat the solder in the hole, remove the iron and quickly insert a pointed non-metallic object, such as a toothpick, from the conductor side.

6. Shape the new component leads and clip them to the proper length. Lead shape should provide stress relief for the component. Insert the leads in the holes, observing the same polarity or orientation as that of the removed component. Apply heat and solder on the conductor side.

ALIGNMENT INSTRUCTIONS

Study these alignment instructions before attempting alignment of the 911A. The output of the sweep or signal generator should be no higher than necessary to obtain output readings because the input signal level must not exceed the limiting level of the integrated circuits in the receiver. Part locations are shown in Figure 6.

Preferred Method for FM Alignment

1. The initial test set-up is shown in Figure 7. The following test equipment is required to align the FM section of the 911A:

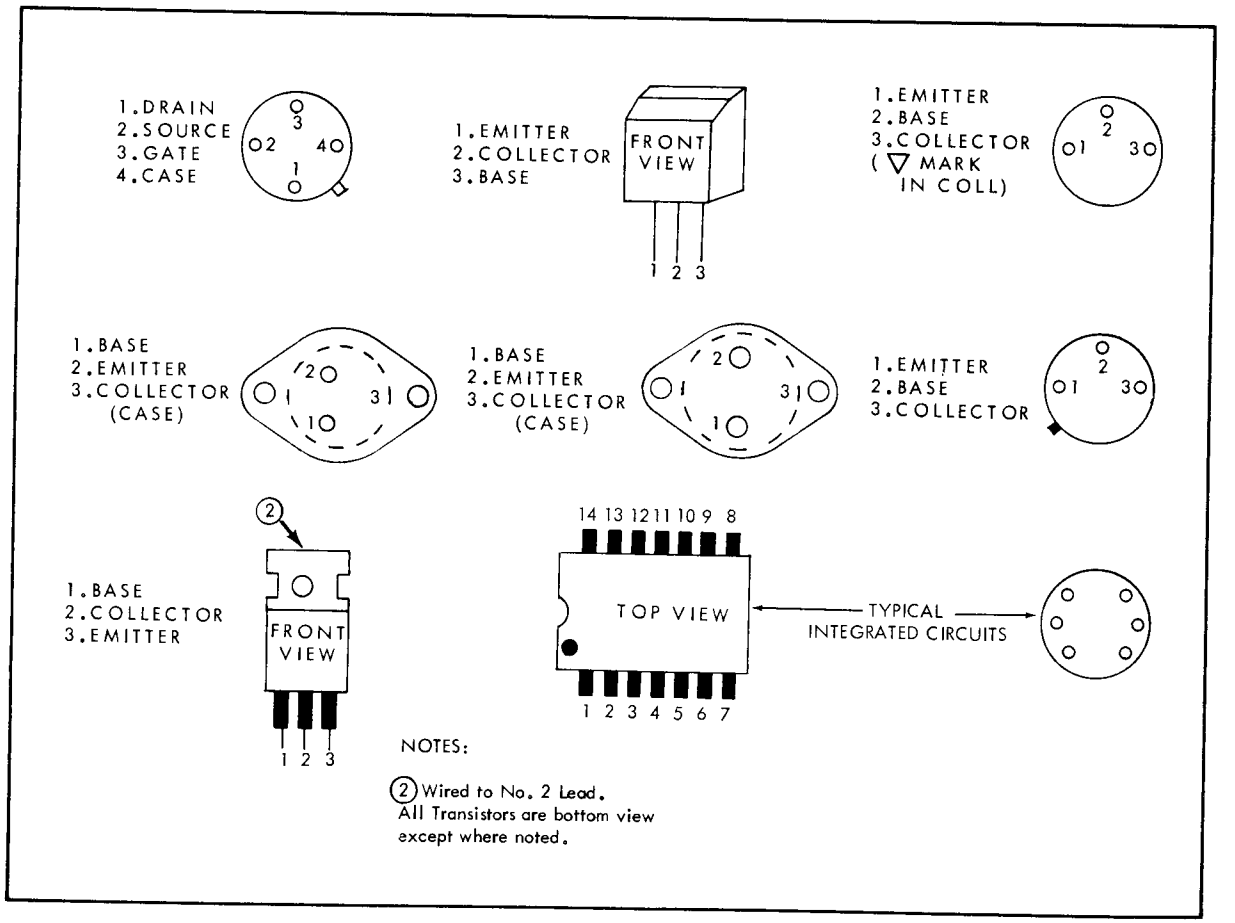


Figure 5. Typical Solid-State Package Configurations

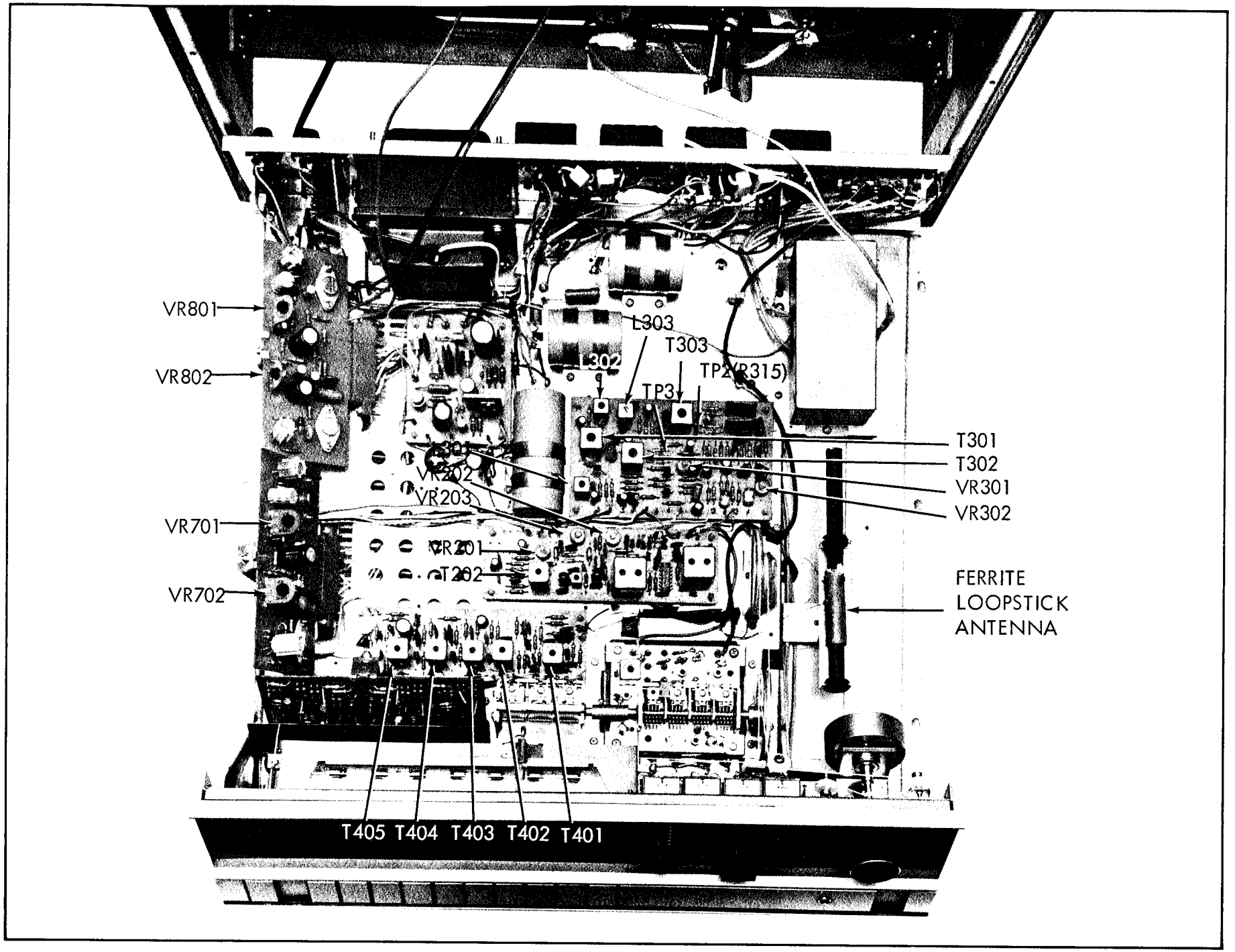


Figure 6. Parts Location, Top View

One RF sweep generator

One FM signal generator (with FM modulation of 400 Hz ± 75 KHz deviation)

One RF detector (see Figure 8)

One de-emphasis network (see Figure 8)

One oscilloscope

One dc VTVM

One ac VTVM

Three 8-ohm, 2W noninductive dummy load resistors

One 8-ohm speaker (equipped with a control to reduce speaker level independently of the load level)

One 300-ohm dummy antenna (see Figure 9)

One 0.01 μF capacitor

2. Set the POWER, FM, MONO, SPKR 1 and SPKR 2 switches on the front panel of the 911A to 'on'. Set all other switches on the front panel of the 911A to 'off'. Set the BALANCE, BASS and TREBLE controls on the front panel of the 911A to the center-line position.

3. Turn the receiver tuning knob counterclockwise (ccw) until it stops. The tuning dial indicator should indicate '0' on the logging scale (center scale) of the tuning dial.

4. Set up the test equipment in accordance with Figure 7.

5. Connect the sweep generator through a 0.01 μF capacitor to the 'test point' (mixer FET source).

6. Connect the RF detector to pin 1 of IC203.

7. Set the output of the sweep generator so no limiting occurs with a sweep width of approximately 1 MHz.

8. Tune first the bottom and then the top of T101 for a maximum reading on the dc VTVM. The symmetrical IF bandpass curve displayed on the oscilloscope should be similar to the curve shown in Figure 10.

9. Remove the RF detector from pin 1 of IC203 and connect the vertical input of the oscilloscope to the FM IF output terminal through a de-emphasis network of 33KΩ resistance and 0.0022 μF capacitance as shown in Figure 8.

10. Adjust the top of T202 until the adjustment screw is as high as it will go; then tune the bottom of T202 for a maximum symmetrical response on the oscilloscope. Then adjust the top of T202 until a symmetrical "S" curve is observed on the oscilloscope.

11. Remove all test equipment and test aids from the 911A.

12. Connect an 8-ohm, 2W noninductive dummy load resistor across each of three speaker output terminal pairs.

13. Connect the 8-ohm speaker across the remaining speaker output terminal pair.

14. Connect the ac VTVM and oscilloscope across one of the 8-ohm, 2W noninductive dummy load resistors.

15. Set the signal generator output frequency to 90 MHz and set its FM modulation to 400 Hz ±75 KHz deviation.

16. Connect the signal generator output through the 300Ω dummy antenna to the FM 300Ω antenna terminals on the rear of the receiver as shown in Figure 9.

17. Tune the receiver to 90 MHz.

18. Adjust the signal generator output level to about 100 μV.

19. Observe the waveform on the oscilloscope. It should be a clean, symmetrical sine wave.

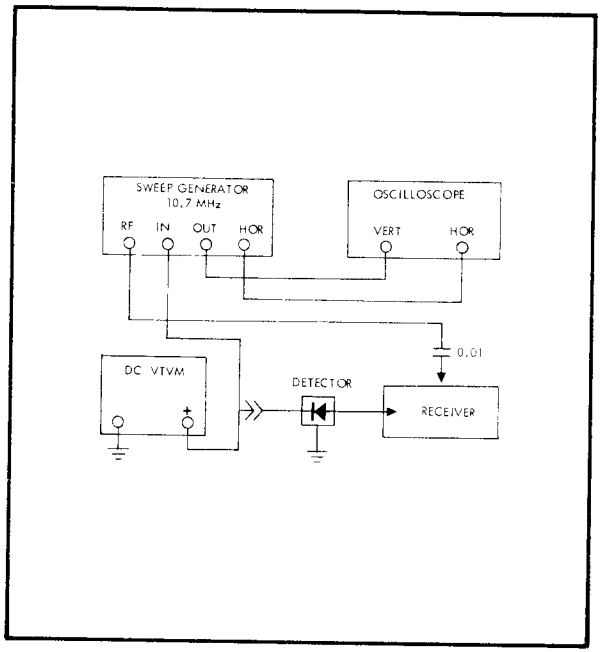


Figure 7. Initial Test Equipment Set-Up

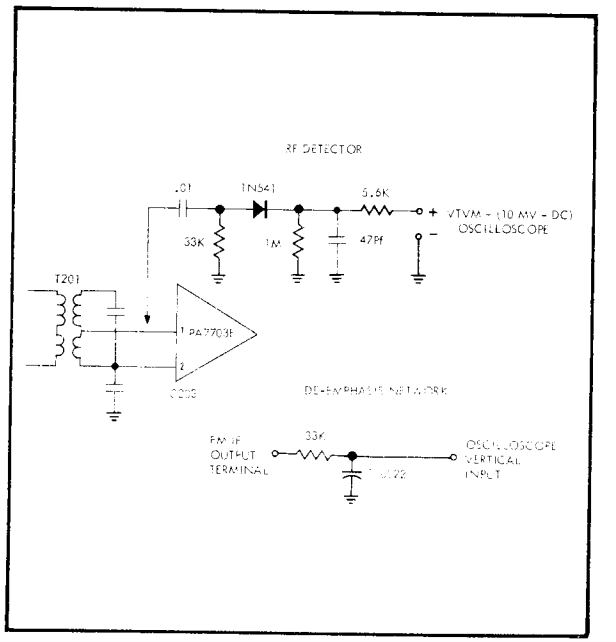


Figure 8. RF Detector and De-emphasis Network

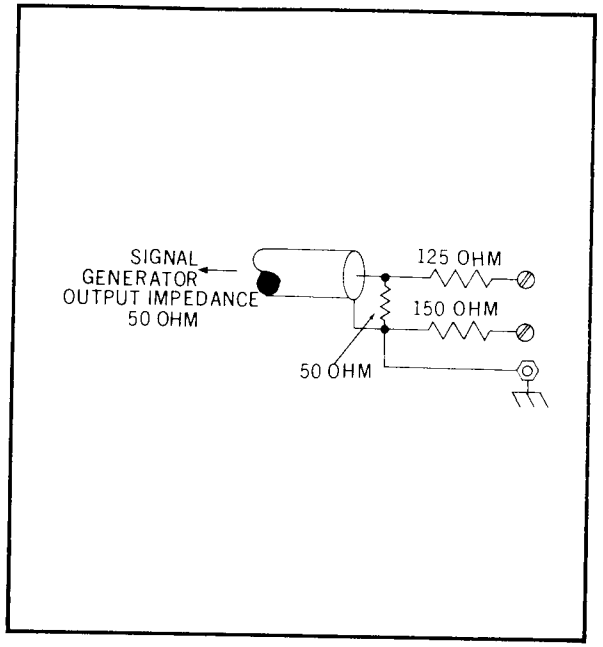


Figure 9. 300-Ohm Dummy Antenna

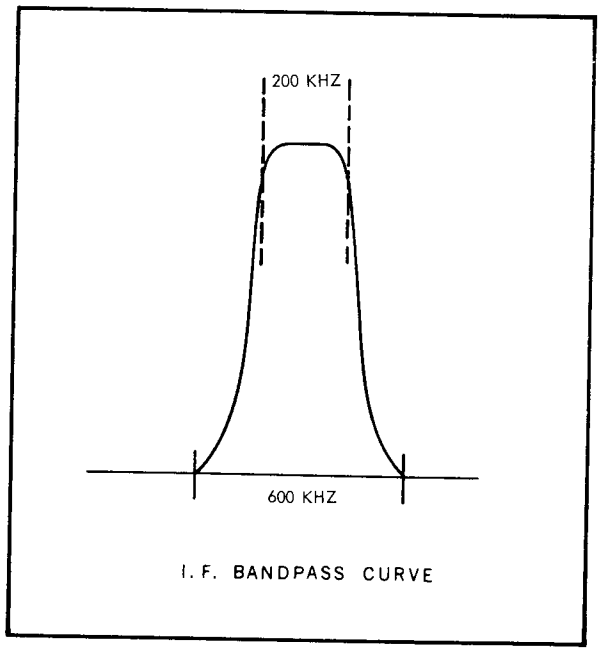


Figure 10. Oscilloscope Display of Symmetrical IF Bandpass Curve

20. Reduce the signal generator output level across the 50Ω resistor (see Figure 9) to about 4 μV.

21. Tune L106 for a maximum reading on the ac VTVM and for a clean trace on the oscilloscope; then tune L101, L103 and L105 for a maximum reading on the ac VTVM.

22. Set the signal generator output frequency to 106 MHz and set its FM modulation to 400 Hz ±75 KHz deviation.

23. Tune the receiver to 106 MHz.

24. Tune the oscillator trimmer for a maximum reading on the ac VTVM and for a clean trace on the oscilloscope; then tune the trimmers of the RF amplifier stages for a maximum reading on the ac VTVM.

25. Repeat Steps 21 through 24 until no improvement is observed on the ac VTVM and a clean symmetrical sine wave is observed on the oscilloscope.

26. Adjust the signal generator output level at 50 ohm (Figure 9) to 10 μV.

27. Set the MUTE switch on the front panel of the 911A to 'on' and adjust VR202 on the FM IF board of the receiver until a 400 Hz sine wave first appears on the oscilloscope. DO NOT adjust VR202 any further than this point.

28. Remove the oscilloscope and ac VTVM from speaker terminals and connect them to the RECORDER OUTPUT jacks.

29. Adjust VR201 until the ac VTVM reading is 1V.

30. Disconnect test equipment.

Preferred Method for AM Alignment

1. The following test equipment is required to align the AM section of the 911A:

   One RF sweep generator with range from 400 to 1800 KHz

   One oscilloscope

   One 0.01 μF capacitor

   Three 8-ohm, 2W noninductive dummy load resistors

   One 8-ohm speaker (equipped with a control to reduce speaker level independently of the load level)

   One 6-inch jumper wire with alligator clips

2. Set the POWER, AM, MONO, SPKR 1 and SPKR 2 switches on the front panel of the 911A to 'on'. Set all other switches on the front panel of the 911A to 'off'. Set the BALANCE, BASS and TREBLE controls on the front panel of the 911A to the center-line position.

3. Turn the receiver tuning knob ccw until it stops. The tuning dial indicator should indicate '0' on the logging scale (center scale) of the tuning dial.

4. Connect the output of the sweep generator through a 0.01 μF capacitor to the mixer base test point.

5. Connect the jumper across the tuning capacitor of the AM oscillator and ground. This will short circuit the capacitor and disable the AM oscillator.

6. Set the sweep generator output center frequency to 455 KHz and adjust the output level so no limiting occurs.

7. Connect the oscilloscope positive probe to the

audio output test point of the AM IF stage and connect its negative probe to ground. Observe the response output of the AM IF stage.

8. Tune T403, T404 and T405 until a maximum symmetrical response is observed on the oscilloscope.

9. Disconnect the jumper from the tuning capacitor of the AM oscillator.

10. Disconnect the output of the sweep generator from the mixer base test point and connect it to the AM antenna terminal.

11. Connect an 8-ohm, 2W noninductive dummy load resistor across each of three speaker output terminal pairs.

12. Connect the 8-ohm speaker across the remaining speaker output terminal pair.

13. Set the sweep generator output center frequency to 600 KHz and adjust the sweep generator output level to about 1 mV.

14. Tune the receiver to 600 KHz.

15. Tune first the top and then the bottom of T402 and T401, and adjust the core of the ferrite loopstick antenna until a maximum symmetrical response is observed on the oscilloscope.

16. Set the sweep generator output center frequency to 1400 KHz.

17. Tune the receiver to 1400 KHz.

18. Adjust the oscillator, rf stage and the antenna tuned-circuit trimmer capacitors until a maximum symmetrical response is observed on the oscilloscope.

19. Repeat Steps 13 through 18 until no improvement is observed on the oscilloscope.

20. Disconnect all test equipment from the receiver except the dummy load resistors and the speaker.

21. Tune across the dial. There should be smooth tuning of stations.

Multiplex Alignment Method

1. The following test equipment is required to align the multiplex section of the 911A:

   One FM signal generator

   One MPX signal generator

   One oscilloscope

   One ac VTVM

   One audio oscillator (adjustable to 100 KHz)

2. Connect the FM signal generator output to the FM 300Ω antenna terminals.

3. Connect the oscilloscope and ac VTVM to testpoint TP2 (R315) on the FM MPX board.

4. Set the FM signal generator output frequency to 98 MHz and externally modulate this signal to 67 KHz with 7.5 KHz deviation. Adjust the output level of the FM signal generator to 1 mV.

5. Tune the receiver to 98 MHz.

6. Adjust L301 to provide a minimum indication on the ac VTVM and oscilloscope.

7. Change the external modulation of the 98 MHz signal in Step 4 from 67 KHz to 71 KHz with 7.5 KHz deviation.

8. Adjust L302 to provide a minimum indication on the ac VTVM and oscilloscope.

9. Change the external modulation of the 98 MHz signal in Step 7 from 71 KHz with 7.5 KHz deviation to 19 KHz with 7.5 KHz deviation.

10. Adjust L303 to provide a minimum indication on the ac VTVM and oscilloscope.

11. Disconnect the ac VTVM and oscilloscope from testpoint TP2 and connect them to TP3 (base TR303) on the FM MPX board.

12. Adjust T301 and T302 to provide a maximum indication on the ac VTVM and oscilloscope.

13. Repeat Step 4, except externally modulate the signal with the MPX signal generator to 19 KHz with 4 KHz deviation.

14. Disconnect the ac VTVM and oscilloscope from TP3 and connect them to the RECORD OUTPUT R channel jacks.

15. Adjust VR301 until the STEREO lamp illuminates. DO NOT adjust beyond that point.

16. Set the MPX signal generator output frequency to 19 KHz, 10% deviation, the L+R control to 45% and the L-R control to 45%. Then set the channel control to the RIGHT channel at 1 KHz and adjust T303 until a maximum indication is obtained on the ac VTVM and oscilloscope.

17. Set the channel control on the MPX signal generator to the LEFT channel at 1 KHz and adjust VR302 until a minimum indication is obtained on the ac VTVM and oscilloscope.

18. Readjust T303 until a minimum indication is obtained on the ac VTVM and oscilloscope.

19. Disconnect the test equipment.

Main Amplifier Adjustment Method

1. A dc VTVM is required to adjust the main amplifier board for each channel.

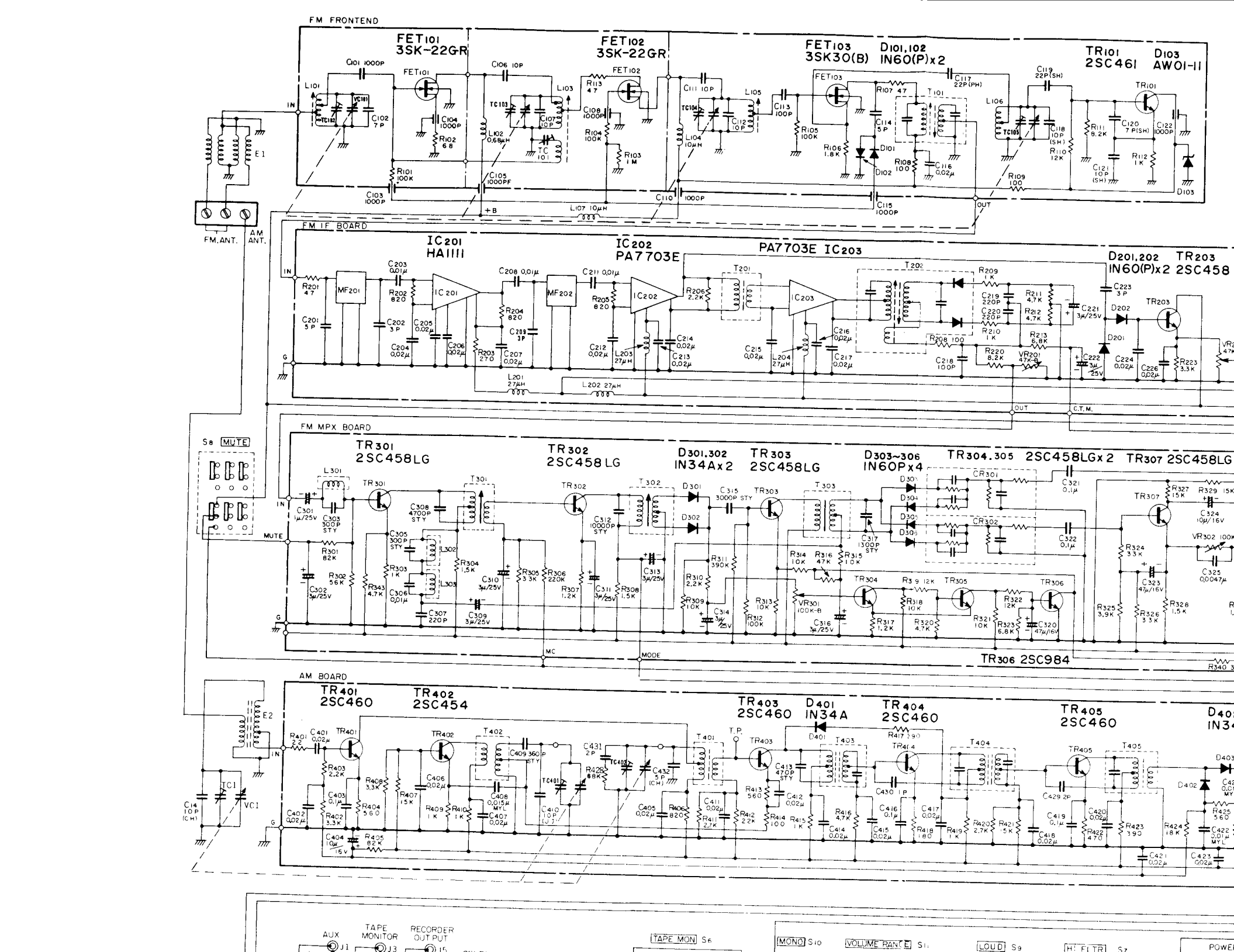
2. Connect the dc VTVM positive probe to board connector pin E1 and the negative probe to board connector pin VQ.

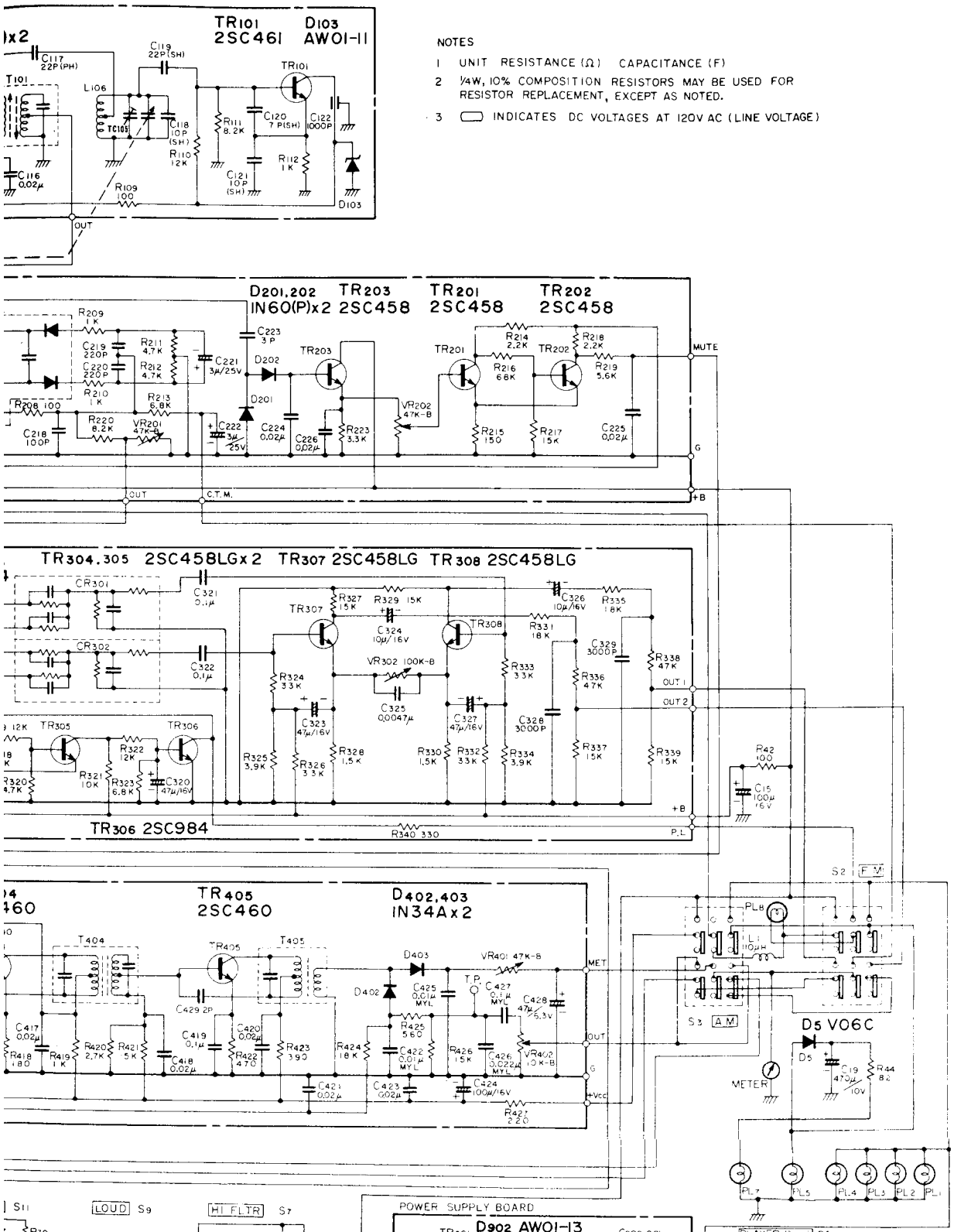
3. Adjust VR702 (or VR802, depending on board undergoing adjustment) to provide an indication of 15 mV on the dc VTVM. This establishes the correct idle current.

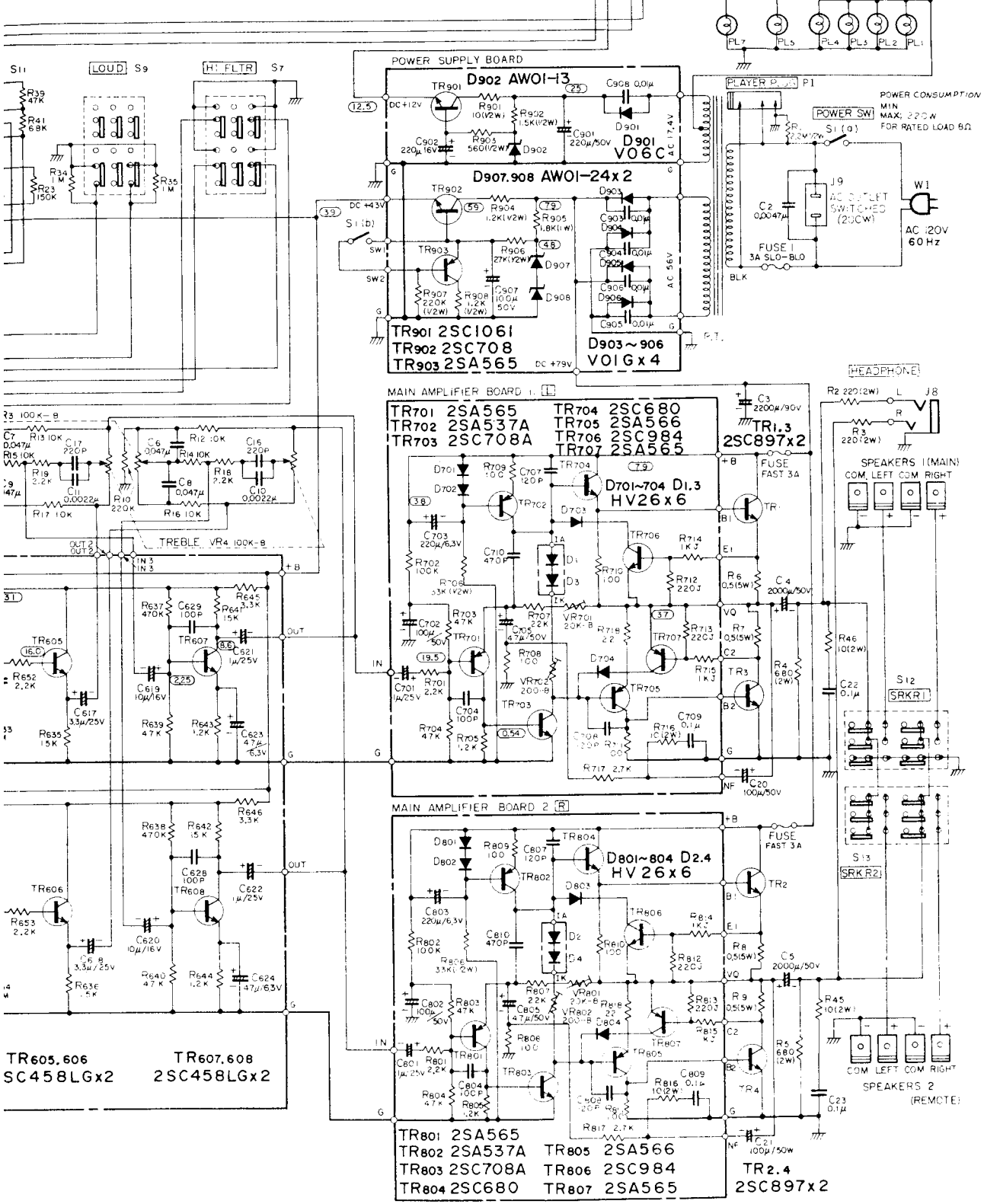
4. Disconnect the dc VTVM from the board and connect its positive probe to board connector pin VQ and its negative probe to chassis ground.

5. Adjust VR701 (or VR801) until a reading of 37V is obtained on the dc VTVM.

6. Disconnect the dc VTVM.


FM FRONTEND
FET101 3SK-22GR
FET102 3SK-22GR
FET103 3SK30(B)
D101,102 IN60(P)x2
TR101 2SC461
D103 AW01-11
FM.ANT.
AM ANT.
FM IF BOARD
IC201 HA1111
IC202 PA7703E
PA7703E IC203
D201,202 IN60(P)x2
TR203 2SC458
FM MPX BOARD
TR301 2SC458LG
TR302 2SC458LG
D301,302 IN34Ax2
TR303 2SC458LG
D303~306 IN60Px4
TR304,305 2SC458LGx2
TR307 2SC458LG
TR306 2SC984
AM BOARD
TR401 2SC460
TR402 2SC454
TR403 2SC460
D401 IN34A
TR404 2SC460
TR405 2SC460
AUX
TAPE MONITOR
RECORDER OUT PUT
TAPE MON S6
MONO S10
VOLUME RANGE S11
LOUD S9
HI FLTR S7
POWER
MUTE
MODE
MC
OUT
C.T.M.


TR101 D103
2SC461 AW01-11
NOTES
1 UNIT RESISTANCE (Ω) CAPACITANCE (F)
2 1/4W, 10% COMPOSITION RESISTORS MAY BE USED FOR RESISTOR REPLACEMENT, EXCEPT AS NOTED.
3 INDICATES DC VOLTAGES AT 120V AC (LINE VOLTAGE)
D201,202 TR203 TR201 TR202
IN60(P)x2 2SC458 2SC458 2SC458
TR304,305 2SC458LGx2 TR307 2SC458LG TR308 2SC458LG
TR306 2SC984
TR405 D402,403
2SC460 IN34Ax2
D5 V06C
POWER SUPPLY BOARD
D902 AW01-13
MUTE
OUT
C.T.M.
+B
P.L
MET
+Vcc
S2 FM
S3 AM
S9 LOUD
S7 HI FLTR
METER


POWER SUPPLY BOARD
D902 AWO1-13
D907.908 AWO1-24x2
D901 V06C
D903~906 V01Gx4
TR901 2SC1061
TR902 2SC708
TR903 2SA565
POWER SW
PLAYER P.W.B. P1
POWER CONSUMPTION
MIN
MAX: 220W
FOR RATED LOAD 8Ω
AC OUTLET SW:TIED (200W)
AC 120V 60Hz
FUSE 1 3A SLO-BLO
LOUD S9
HI FLTR S7
TREBLE VR4 100K-B
MAIN AMPLIFIER BOARD 1 L
TR701 2SA565
TR702 2SA537A
TR703 2SC708A
TR704 2SC680
TR705 2SA566
TR706 2SC984
TR707 2SA565
TR1,3 2SC897x2
D701~704 D1.3 HV26x6
MAIN AMPLIFIER BOARD 2 R
D801~804 D2.4 HV26x6
TR801 2SA565
TR802 2SA537A
TR803 2SC708A
TR804 2SC680
TR805 2SA566
TR806 2SC984
TR807 2SA565
TR2.4 2SC897x2
TR605,606 2SC458LGx2
TR607,608 2SC458LGx2
HEADPHONE
SPEAKERS 1(MAIN)
SPEAKERS 2 (REMOTE)
SRKR1
SRKR2
FUSE FAST 3A

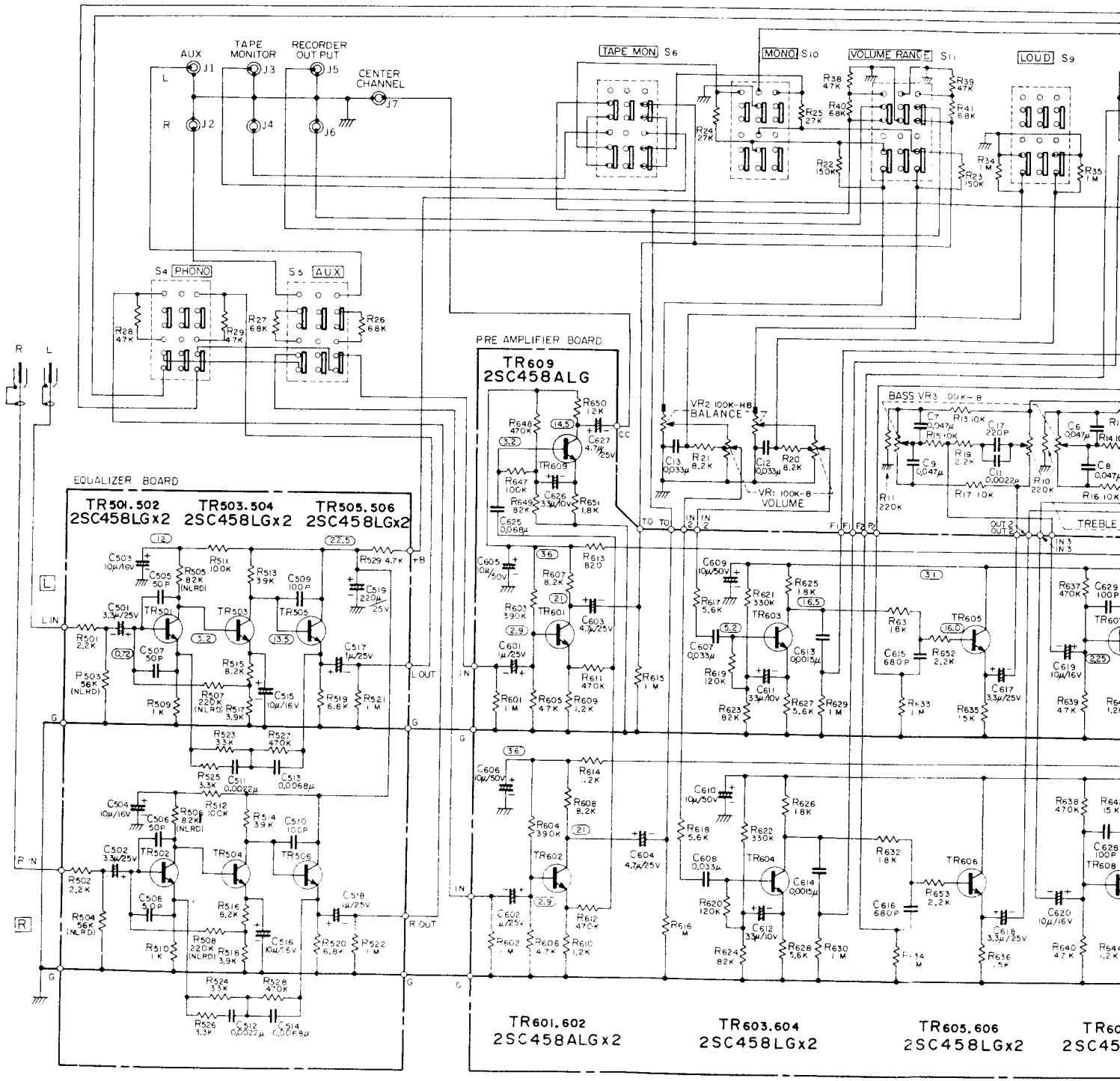


Figure 11. Schematic, 911A AM/FM Stereo Receiver